Enabler Release Definition for Secure User Plane Location (SUPL)

Candidate Version 3.0 – 08 Mar 2011

Open Mobile Alliance
OMA-ERELD-SUPL-V3_0-20110308-D

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1. Scope

The scope of this document is limited to the Enabler Release Definition of Secure User Plane Location (SUPL) 3.0 according to OMA Release process and the Enabler Release specification baseline listed in section 5.

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2. References

2.1 Normative References

[23.271] 3GPP TS 23.271 Release 6,
URL:http://www.3gpp.org/ftp/Specs/latest/Rel-6/23_series/

[DMAccDDF] "OMA SUPL Managed Object DDF", Version 2.0, Open Mobile Alliance™. OMA-SUP-MO_SUPL-V2_0.
URL:http://www.openmobilealliance.org/

[DMDDFDTD] "OMA DM Device Description Framework DTD", Version 1.2, Open Mobile Alliance™. OMA-SUP-dtd_dm_ddf-v1_2.
URL:http://www.openmobilealliance.org/

[IOPPROC] "OMA Interoperability Policy and Process", Version 1.10, Open Mobile Alliance™, OMA-ORG-IOP-Process-V1_10,
URL:http://www.openmobilealliance.org/

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997,
URL:http://www.ietf.org/rfc/rfc2119.txt

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997,
URL:http://www.ietf.org/rfc/rfc2119.txt

[RLP 1.0] "Roaming Location Protocol ", Version 1.0, Open Mobile Alliance™, OMA-TS-RLP-V1_0
URL:http://www.openmobilealliance.org/

[SCRRULES] "SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures,
URL:http://www.openmobilealliance.org/

[SUPL 1.0 AD] "SUPL Architecture Document", Version 1.0, Open Mobile Alliance™, OMA-AD-SUPL-V1_0
URL:http://www.openmobilealliance.org/

[SUPL AD] "SUPL Architecture Document", Version 2.0, Open Mobile Alliance™, OMA-AD-SUPL-V2_0
URL:http://www.openmobilealliance.org/

[SUPL MO] "OMA Management Object for SUPL", Version 2.0, Open Mobile Alliance™, OMA-TS-SUPL-MO-V2_0
URL:http://www.openmobilealliance.org/

[SUPL RD] "SUPL Requirements Document", Version 2.0, Open Mobile Alliance™, OMA-RD-SUPL-V2_0
URL:http://www.openmobilealliance.org/

[SUPL TS-ILP] "UserPlane Location Protocol ", Version 2.0, Open Mobile Alliance™, OMA-TS-ILP-V2_0
URL:http://www.openmobilealliance.org/

[SUPL TS-ULP] "UserPlane Location Protocol ", Version 2.0, Open Mobile Alliance™, OMA-TS-ULP-V2_0
URL:http://www.openmobilealliance.org/

[SUPL1.0 RD] "SUPL Requirements Document", Version 1.0, Open Mobile Alliance™, OMA-RD-SUPL-V1_0
URL:http://www.openmobilealliance.org/

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Version 2.8, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_8, URL:http://www.openmobilealliance.org/

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3. Terminology and Conventions

3.1 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except “Scope”, "Release Version Overview" and “Conformance Requirements Notation Details”, are normative, unless they are explicitly indicated to be informative.

The formal notation convention used in sections 8 and 9 to formally express the structure and internal dependencies between specifications in the Enabler Release specification baseline is detailed in [SCRRULES].

3.2 Definitions

Enabler Release	Collection of specifications that combined together form an enabler for a service area, e.g. a download enabler, a browsing enabler, a messaging enabler, a location enabler, etc. The specifications that are forming an enabler should combined fulfil a number of related market requirements.
Minimum Functionality Description	Description of the guaranteed features and functionality that will be enabled by implementing the minimum mandatory part of the Enabler Release.

3.3 Abbreviations

AD	Architecture Document
AFLT	Advanced Forward Link Trilateration
A-GANSS	Assisted Galileo and Additional Navigation Satellite Systems
A-GNSS	Assisted Global Navigation Satellite System
A-GPS	Assisted GPS
API	Application Programming Interface
EOTD	Enhanced Observed Time Difference
ERDEF	Enabler Requirement Definition
ERELD	Enabler Release Definition
E-SLP	Emergency SLP
FQDN	Fully Qualified Domain Name
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ILP	Internal Location Protocol
HLIA	Historical Location Immediate Request
HLIR	Historical Location Immediate Answer
H-SLC	Home SLC
H-SLP	Home SLP
H-SPC	Home SPC
HTTP	Hypertext Transfer Protocol
HTTPS	HTTP Secure
IETF	Internet Engineering Task Force

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IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
LCS	Location Services
LTE	Long Term Evolution
MAC	Message Authentication Code
MC	Message Center
MLP	Mobile Location Protocol
MLS	Mobile Location Services
MNO	Mobile Network Operator
MSISDN	Mobile Subscriber ISDN Number
OMA	Open Mobile Alliance
OTDOA	Observed Time Difference of Arrival
PAP	Push Access Protocol
PC	Personal Computer
PLMN	Public Land Mobile Network
POTAP	WAP Push Over The Air Protocol
PPG	Push Proxy Gateway
PSK-TLS	Pre-Shared Key Ciphersuites for Transport Layer Security
QoP	Quality of Position
RD	Requirement Document
RLP	Roaming Location Protocol
RRC	Radio Resource Control
RRLP	Radio Resource LCS Protocol
R-SLP	Requesting SLP
SADF	SUPL Assistance Delivery Function
SCF	SUPL Charging Function
SET	SUPL Enabled Terminal
SIF	SUPL Initiation Function
SIP	Session Initiation Protocol
SLC	SUPL Location Center
SLIA	Standard Location Immediate Answer
SLIR	Standard Location Immediate Request
SLIRep	Standard Location Immediate Report
SLP	SUPL Location Platform
SMLC	Serving Mobile Location Center
SMPP	Short Message Peer to peer Protocol
SMS	Short Message Service
SMSC	Short Message Service Center
SPC	SUPL Positioning Center
SPCF	SUPL Position Calculation Function

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SPF	SUPL Privacy Function
SRLIA	Standard Roaming Location Immediate Answer
SRLIR	Standard Roaming Location Immediate Request
SRRF	SUPL Reference Retrieval Function
SRSF	SUPL Roaming Support Function
SSF	SUPL Security Function
SSMF	SUPL Service Management Function
SSPF	SUPL SET Provisioning Function
SSRLIA	Standard SUPL Roaming Location Immediate Answer
SSRLIR	Standard SUPL Roaming Location Immediate Request
SSRP	Standard SUPL Roaming Position
SUPL	Secure User Plane Location
TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
TLS	Transport Layer Security
UDP	User Datagram Protocol
UE	User Equipment
UICC	Universal Integrated Circuit Card
UMB	Ultra Mobile Broadband
URL	Uniform Resource Locator
V-SLC	Visited SLC
V-SPC	Visited SPC
V-SLP	Visited SLP
WAP	Wireless Application Protocol
WCDMA	Wideband Code Division Multiple Access

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4. Release Version Overview

This document outlines the Enabler Release Definition for SUPL Enabler and the respective conformance requirements for clients and servers implementing claiming compliance to it as defined by Open Mobile Alliance across the specification baseline.

SUPL V2.0 describes the protocol between a SUPL Enabled Terminal (SET) and SUPL Location Platform (SLP) and the protocol between SLC and SPC.

Communication between SET and SLP is transported over a secured IP connection, with one exception: for network initiated SUPL transactions the SUPL INIT message shall be sent as an MT SMS [TIA-637] using a dedicated Teleservice Identifier [TIA-41] for CDMA/HRPD/UMB, for GSM/WCDMA/TD-SCDMA/LTE, the WDP [WAP WDP] framing SHALL be used for MT SMS, and for WLAN/I-WLAN/WiMAX/I-WiMAX [UDP/IP] framing SHALL be used. For GSM/WCDMA/TD-SCDMA/LTE, a SUPL INIT message can also be sent via WAP Push, where the Push message from the PPG to SET shall follow the WAP Push specifications as per [WAP POTAP].

SUPL draws on support from RLP, a protocol specification from the OMA MLS Enabler. RLP is used such that SLP's from different SUPL providers can exchange information for positioning of roaming subscribers.

4.1 Version 1.0 Functionality

SUPL V1.0 supports immediate positioning procedures for GSM, WCDMA/TD-SCDMA and CDMA networks. It supports the terminal based positioning methods defined for GSM, WCDMA/TD-SCDMA and CDMA such as A-GPS, EOTD and Cid. The protocol between SLC and SPC is not defined in SUPL V1.0

SUPL V1.0 supports the following modes of operation for selected deployments:

- Proxy flows for GSM/WCDMA/TD-SCDMA deployments
- Proxy flows for CDMA/CDMA2000 deployments
- Non-proxy flows for CDMA/CDMA2000 deployments

4.2 Version 2.0 Functionality

SUPL 2.0 adds a number of features to SUPL V1.0. The major functional enhancements are:

- Triggered positioning procedures, both periodic and area event.
- Emergency positioning procedures.
- Support of A-GANSS positioning method and improvements to enhanced cell id positioning method
- Support of I-WLAN, WiMAX, I-WiMAX, HRPD/UMB, LTE networks.
- Positioning procedures for delivery to third party and retrieval of location of another SET.

In addition the protocol between SLC and SPC, i.e. the ILP, is defined.

4.2.1 User Plane Location Protocol (ULP)

The UserPlane Location Protocol (ULP) is a protocol-level instantiation of the Lup reference point. The protocol is used between the SLP (SUPL Location Platform) and a SET (SUPL Enabled Terminal). For more details about SUPL Requirements refer to [SUPL RD]. For more details about SUPL architecture and call-flows, refer to [SUPL AD]

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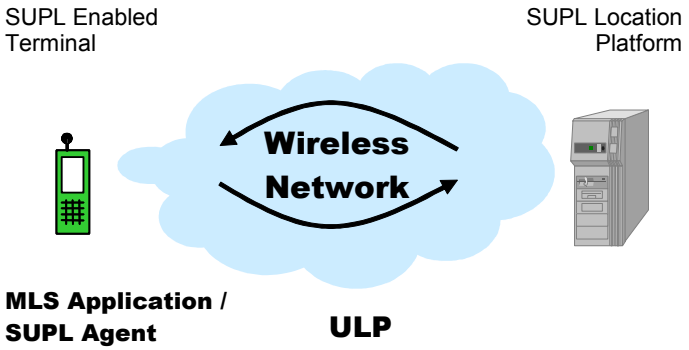

Figure 1: UserPlane Location Protocol

Possible realizations of a SUPL Location Platform functionality are within the GMLC, which is the Location Server defined in GSM and UMTS, and the MPC, which is defined in ANSI standards. Since the SUPL Location Platform should be regarded as a logical entity, other implementations are possible.

Depending which SUPL Agent initiates the dialogue, a SUPL INIT message is sent to the SET (network initiated), or a SUPL START message is sent to the SLP (SET initiated).

ULP can be implemented using various transport mechanisms. Currently, the only mapping defined is a mapping to TCP, with the following exception: the SUPL INIT message is transported over WAP Push or MT SMS.

4.2.2 Internal Location Protocol (ILP)

The function of the Llp reference point is logically separated into the Positioning Control Function and the Positioning Data Function

4.2.3 Roaming Location Protocol (RLP)

RLP is an element of the OMA MLS Enabler, and facilitates the SUPL roaming scenarios. RLP is also known as Inter-Location Server Mobile Location Protocol.

Functional Requirements for both Application to Location Server interface and inter-Location Server interface for 3GPP networks may be found in 23.271 Rel6 [23.271]. However, those parts of RLP which are used by SUPL are specified in a way that they can be used by wireless networks other than 3GPP.

RLP can be implemented using various transport mechanisms. Currently, the only mapping defined is a mapping to HTTP.

4.3 Version 3.0 Functionality

SUPL 3.0 adds a number of features to SUPL V2.0. The major functional enhancements are:

- Improved Location for IP Emergency Calls
- Improved Location performance
- Triggered Location Enhancement
- Improved Indoor Location Accuracy
- SET to SET Location
- Authentication Enhancements
- Privacy Enhancements
- Additional access networks

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- Support for Extended Location Information

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5. Document Listing for SUPL 3.0

This section is normative.

Doc Ref	Permanent Document Reference	Description
Requirement Document		
[SUPL3.0_RD]	OMA-RD-SUPL-V3_0-20100921-C	Requirement Document for SUPL 3.0 Enabler
Architecture Document		
[SUPL3.0_AD]	OMA-AD-SUPL-V3_0-20110308-C	Architecture Document for SUPL 3.0 Enabler
Technical Specifications		
[SUPL3.0_TS	OMA-TS-ULP-V3_0-20110214-D	Specification that defines the SUPL 3.0 UserPlane Location Protocol.
Supporting Files		

Table 1: Listing of Documents in SUPL 3.0 Enabler

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6. OMNA Considerations

This release does not have any OMNA items for handling

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7. Conformance Requirements Notation Details

This section is informative

The tables in following chapters use the following notation:

Item: Entry in this column MUST be a valid ScrItem according to [SCRRULES].

Feature/Application: Entry in this column SHOULD be a short descriptive label to the **Item** in question.

Requirement: Expression in the column MUST be a valid TerminalExpression according to [SCRRULES] and it MUST accurately reflect the architectural requirement of the **Item** in question.

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8. ERDEF for SUPL 3.0 - Client Requirements

This section is normative.

Item	Feature / Application	Requirement
OMA-ERDEF-<<ENABLER>>-C-001-<<M/O>>	<<ENABLER>> Client	

Table 2: ERDEF for SUPL 3.0 Client-side Requirements

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9. ERDEF for SUPL 3.0 - Server Requirements

This section is normative.

Item	Feature / Application	Requirement
OMA-ERDEF-<<ENABLER>>-S-001-<<M/O>>	<<ENABLER>> Server	

Table 3: ERDEF for SUPL 3.0 Server-side Requirements

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Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior 3.0 version

A.2 Draft/Candidate Version 3.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ERELD-SUPL-V3_0	03 Nov 2009	n/a	First draft
	11 Nov 2009	2.1, 3.3, 4	CR incorporated: OMA-LOC-2009-0300
	16 Nov 2009	5	Updated document list
	15 Dec 2009	4.2, 4.3	Implemented CR: OMA-LOC-2009-0319
	08 Jan 2010	All	Editorial Corrections: Removal of empty App B Updated to 2010 template Updated document list
Candidate Versions OMA-ERELD-SUPL-V3_0	26 Jan 2010	n/a	TP approved via R&A ref# OMA-TP-2010-0006-INP_SUPL_V3_0_RD_for_Candidate_Approval
Draft Versions OMA-ERELD-SUPL-V3_0	10 Sep 2010	5	Document list updated
	13 Sep 2010	2.1, 5	Normative references sorted in alphabetical order Document list updatedbefore notification of the RD to TP
Candidate Versions OMA-ERELD-SUPL-V3_0	21 Sep 2010	n/a	Notified to TP: OMA-TP-2010-0418-INP_SUPL_V3_0_RD_for_Notification
Draft Versions OMA-ERELD-SUPL-V3_0	03 Jan 2011	5	Document list updated
	24 Feb 2011	5	Updated document listing
Candidate Versions OMA-ERELD-SUPL-V3_0	08 Mar 2011	n/a	TP approved via R&A: OMA-TP-2011-0080-INP_SUPL_3.0_AD_for_Candidate_approval

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